

THE 1999 BENHS PRESIDENTIAL ADDRESS—PART 2 A CONSERVATION AGENDA FOR ENTOMOLOGISTS FOR THE NEXT 100 YEARS—AN AMATEUR VIEWPOINT?

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INTRODUCTION

Some of the subjects considered in this address are: butterflies—losses, declines and isolation; changes to the British fauna; moths—declines, recording, conservation and collecting; wildlife legislation and species protection; organisations—Butterfly Conservation, BENHS and an Invertebrate Conservation Trust; human population pressure and wildlife habitat fragmentation; localities, dot maps and Red Data book statuses; knowledge, solutions, the choice and the future.

Some issues are: What opportunities are there for the BENHS and its membership to continue to develop our long-established interests and concerns for the conservation of all invertebrates but particularly the Lepidoptera?

As we volunteer information to others can we trust them to allow us to carry on collecting moths etc., when they are indulging in programmes to aid population recovery of the very same species? In other words when they know what we know will they exclude our involvement?

Can plain collecting, without providing added value in ecological or biological information, continue indefinitely? Other than Butterfly Conservation, is the disaggregated model of local records centres and wildlife trusts holding information on the species in their areas the right approach, with no other central independent invertebrate organisation?

A number of entomologists have been working on the possibility of forming an invertebrate conservation trust. This could provide the strong conservation voice that the BENHS and RES have historically backed away from providing.

In the next 20 years the entomological community could perhaps start to acquire at least a handful of nature reserves, managed exclusively for invertebrates *other than butterflies*.

As we experience the first months of a new century it seems appropriate to review some aspects of invertebrate conservation, in terms of what is necessary for its future effectiveness.

THE LARGE BLUE BUTTERFLY

I suppose a major indictment of British entomological and nature conservation organisations of the past century is that we were not able to agree on what was the management regime needed to enable the survival of the population of the original large blue *Maculinea arion* (L.) butterfly. Furthermore those sites on which it did survive became increasingly isolated through changes in agricultural land use, (Muggleton & Benham, 1975). There are other arguments: it mainly occurred in parts of Cornwall, then relatively difficult of access for study and was a species on the edge of its range. Regarding conservation from a European perspective (Kudrna, 1997), the UK invertebrate population is often seen as unimportant, this last

consideration is still used today as a rationale for prescribing that little action needs to be taken by UK enthusiasts.

Despite the considerable cost of the restoration of the large blue I believe it was worth it for the attention it has drawn to invertebrate conservation over the years.

THE DECLINE OF FRITILLARY BUTTERFLIES

Like many other people, serendipity played its part in my introduction to entomology. For instance, I can never resist browsing in bookshops and in about 1962 I came across the "I-Spy" series, especially *I-Spy Butterflies and Moths* (Anon, c. 1954). If my recollection is correct you would score only 40 points for spotting any fritillary butterfly, but 50, for the purple emperor. Today, the scoring system might be reversed in SE England, with the latter much more frequently seen than most fritillaries. Our colleagues in Butterfly Conservation are doing much to address this situation but historically all the national entomological societies have made significant contributions to insect conservation in their own special ways over the past one hundred years. How can we learn from the past to guide our actions for the future? There are many issues I believe facing this Society and entomologists as a whole. Options are suggested for dealing with these issues in order to stimulate debate but not to provide a final answer.

In this context I would first like to explore some aspects of the decline of the smaller fritillary butterflies. The decline in these butterflies during the twentieth century is somewhat enigmatic, for their general retreat to the west and perhaps the north has not really been explained. Luckens (1978) referred to this retreat westwards as having started well before the end of the 19th century.

The marsh fritillary *Euphydryas aurinia* Rott., once had a general distribution all over England but has been in continual decline during my lifetime. In the east of England it was an early 20th century casualty of the removal of water meadows in valley bottoms and of pastures often associated with woodland (Mendel & Piotrowski, 1986), with additional factors being agricultural intensification, drainage of many areas and the scrubbing up of many marshy fields. Nothing has changed and this depressing picture still continues as we experience the beginning of the 21st century.

In the west, in Cornwall we find that the marsh fritillary has declined here also (Frost and Madge, 1991). These authors state that, "Marsh Fritillaries are extremely localised and, according to Emmet & Heath, (1989), they are reluctant to cross even quite small natural obstacles such as low hedges and beds of sedges which restrict the limits of their colonies. In view of this, the occasional appearance of individuals far from known colonies is quite inexplicable". It could be that this statement, where it deals with the species' reluctance to cross obstacles, was just simply wrong, and we did not have enough knowledge in 1989 to be so firm in our convictions about such dispersal limits. Dennis (1977) summarised this type of activity as follows: "basically, movement decreases markedly from the cores of colonies to the periphery where few individuals alone are observed, and beyond that only the occasional strays are noticed". Sadly, I am not convinced that we really know yet why these declines have taken place, despite all the research that has been done by Butterfly Conservation and others recently. Judging from the extracts I have quoted, this decline has been occurring for over a century. Even if we do learn why it has taken place, will the nature conservation community be in a position to do anything about it, especially if *large areas of suitable habitat* are required to be maintained? Equally if research finds

Marsh Fritillary *Eurodryas aurinia*

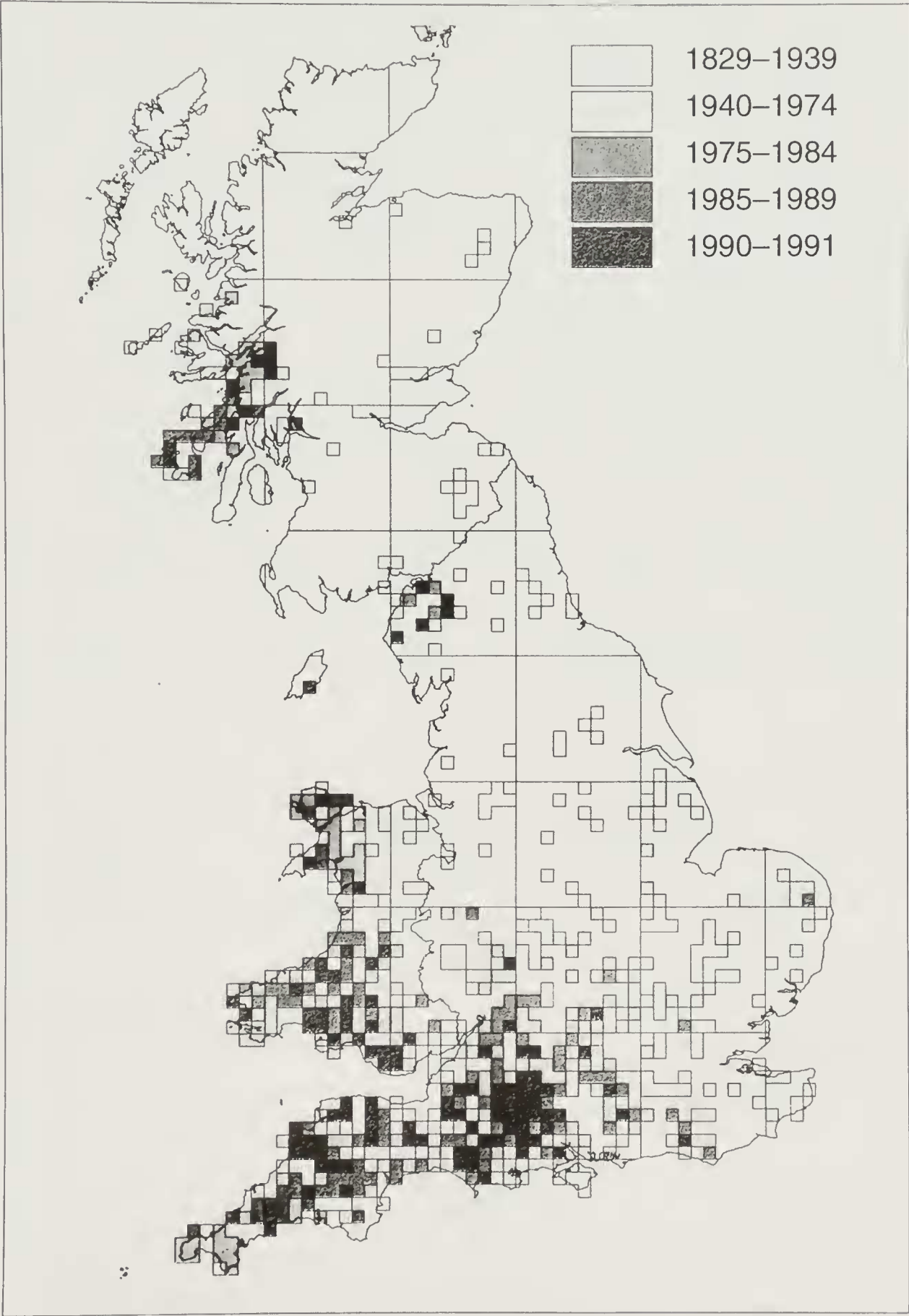


Fig. 1. 1829–1991 ITE distribution map of marsh fritillary *Eurodryas aurinia* Rott.

that not only are large sites required but also links between them, then the conservation programme for many invertebrates is likely to remain under increasing stress. If re-establishments have been going on, they do not appear to have been very successful as the dots of occurrence on the maps are not only reducing in the east of England but in the west as well. I will even own up to a degree of local guilt in this matter which is perhaps applicable to many of us nationally as we see a similar decline in each newly published local list of species. For many years I resided in North Hampshire near to an area which I now know harboured a metapopulation of the marsh fritillary. Colonies of this species wax and wane depending on local conditions, the growth of the food plant devilsbit scabious, *Succisa pratensis*, in these marshy areas (forgetting the colonies on the chalk for convenience), and the relative success, in some years, of the ichneumons that parasitise the larvae.

As I understand it, metapopulation theory is that, as one colony patch of the butterfly disappears, recolonisation is made possible by exploratory female butterflies from other nearby patches. The tendency for this species to seek out the most luxuriant leaves of the food plants (Luckens, 1978) for oviposition suggests that there is a need for a large amount of the food plant that is unaffected by larval activities in the spring preceding the emergence of the adult. As this author suggests, a dozen *E. aurinia* larvae can consume many large scabious plants completely. Thus it could be said that as larvae they are reducing their later chances as adult females of successful oviposition. However, presumably, the cycle of heavy parasitisation will also aid future colony success by wiping out colonies periodically so that the food plant will never be completely overcome, which is perhaps particularly necessary in dry years.

Why a sense of guilt, you may ask? This was due to my lack of a thorough knowledge of where the species occurred locally and my reluctance to explore private

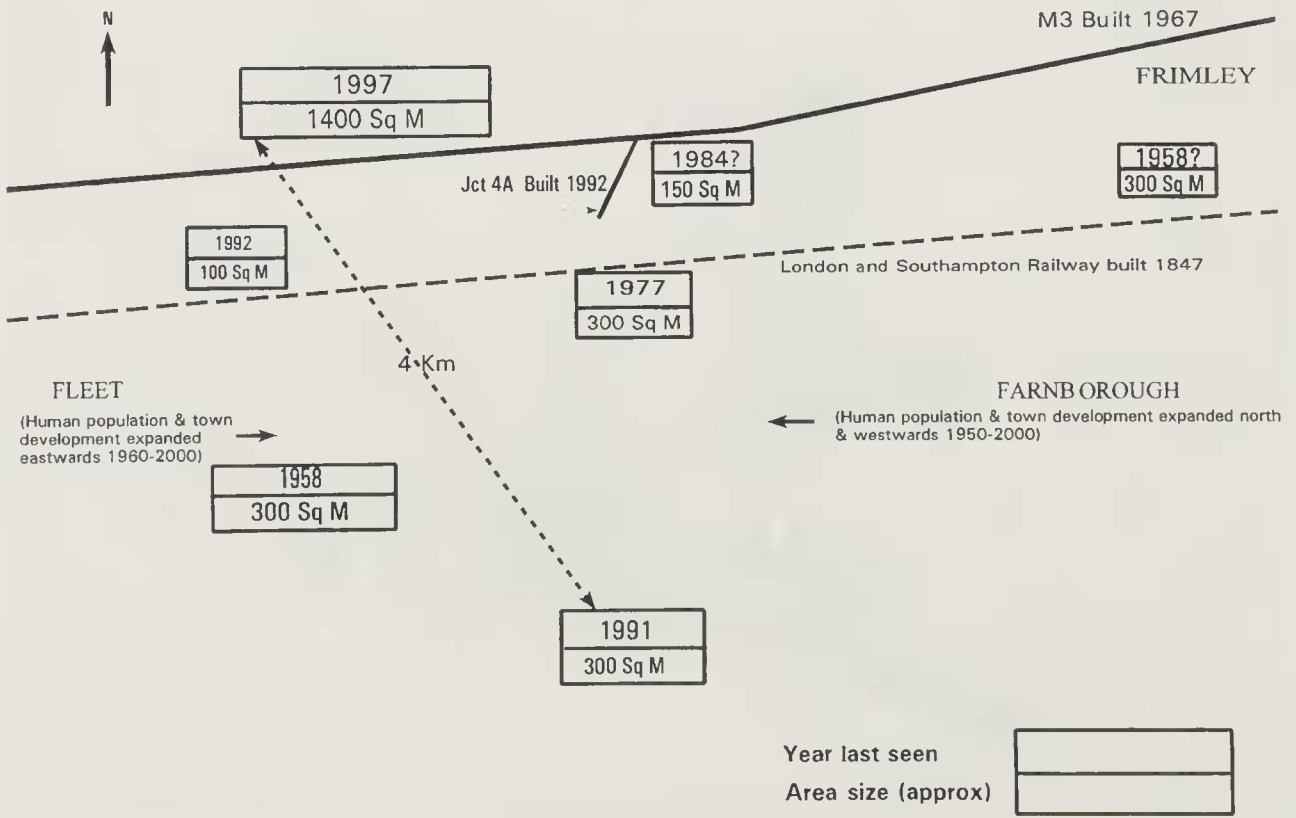


Fig. 2. Marsh fritillary decline in North Hampshire & West Surrey.

ground, it being so much easier to go to publicly owned sites, and perhaps also a failure to network effectively with other entomologists. This is a lesson for us all, for *even today* there is no substitute for having a thorough local knowledge.

The situation today is that the species appears to have almost disappeared from this area at Farnborough, as can be seen from Fig. 2. If it still occurs, it is a very isolated population. This whole area, had before the 1950s a number of suitable sites, but urbanisation and overspill development occurred in the 1960s–70s. The most remote local site known to me, was two miles away in a river valley in Frimley, Surrey and presumably not part of the metapopulation, this was lost to the development of a polish factory in the 1950s–60s. A change of grazing regime to heavy grazing by horses put paid to another area at Farnborough in the 1970s. When this grazing stopped, recolonisation might still have been possible as the grassland gradually reverted to a resemblance of its former condition. However, the site was subsequently developed for offices of a mobile telephone company. A further area on an airfield at Farnborough could still support the species but it is becoming increasingly isolated, as are all the remaining sites. In 1983 The Hampshire & Isle of Wight Wildlife Trust leased another nearby site of six acres in the middle of the species' range in the area at that time. Subsequently, a larger area to the west has also been leased and is being well managed to support an acid grassland community with large areas of devilsbit scabious, *Succisa pratensis*, and bog myrtle, *Myrica gale*. The last marsh fritillary seen was a single example in 1997, allowing the hope that the species is still surviving but at a very low level. This assumes that no individual person decided to introduce a few specimens to the site without telling others, which is suspected. This would, in this example, serve to indicate how damaging such practices are.

I looked for larval evidence on this latter site in 1999 but did not find any. Butterfly Conservation has in recent years sought more of their members to look for this species here. So, even despite the size of this organization, there are still not enough field observers to go round! This last fact was recently freely admitted by their new Chairman (Jeffcoate, 2000) in implying that only 10% of their membership were actually active in the field. Ford & Ford, (1930) described how they had records of a colony near Carlisle from 1881 which they subsequently monitored up to 1930, but fluctuations were a normal event. During one period from 1912–1920, only single examples of the species were seen, but by the mid 1920s it was common once again. Thus hope remains that the marsh fritillary could survive in North Hampshire and become abundant once again.

I will now proceed to delve into some subjects that may impact on our interests very soon. In the future what will happen to land areas that formerly held interesting species of conservation concern which are no longer present? Will we be able to stop them from being developed in perpetuity, in the hope that a species may naturally return, or to allow them to be re-established. The answer is almost certainly not, unless these sites are valuable for other reasons, and they qualify under the national Sites of Special Scientific Interest (SSSI) series or local Sites of Nature Conservation Importance (SNCI) or similar designations.

Should the marsh fritillary be physically returned to those areas in North Hampshire where it was originally recorded from, for re-establishment when we know that the metapopulation recolonisation structure no longer exists and further development is planned for the area? At what point can re-establishment be promoted if we don't ever know conclusively whether an invertebrate has become extinct on a site? Does it matter since we are supplying new genes when we put down some new stock?

Critical decisions were made in early March 2000 about future house building on home counties' sites, the results in the next sixteen years may be that many areas of the South-East are expendable in natural history terms! There are still many colonies of the marsh and other fritillary butterflies in Dorset, provided climatically that this species is not in more serious trouble, efforts to retain it may be concentrated there and also in Devon where it still remains. This is the intention of the [Biodiversity] Species Action Plan: marsh fritillary *Emodryas aurinia* (Barnett & Warren, 1995a), but this will mean an important flagship species is not represented on many of its former sites and the present range will not be maintained. In his address in February 1999 our previous president, Brian Eversham remarked on the former opinion of many conservationists that if you protected the vegetation on any particular site then everything else would be conserved as well. He commented that this idea is now rightly in disfavour, but it is ironic that we may need to protect the vegetation on some sites in the south and south-east if we want to allow eventual recovery of some butterfly populations. Recently I have become aware of the presumed loss of the marsh fritillary from an English Nature site in Somerset. It was also distressing to learn from our recent speaker, Adrian Fowles, of its decline in Wales. Thus, the picture is not all rosy even within its core range.

ISOLATION AND THE WOODLAND FRITILLARIES

Continuing this theme of decline, I will mention the woodland fritillaries in a south-east England context, since in more northern and western regions, Butterfly Conservation research (Barnett and Warren, 1995b) appears to suggest that some of these species are more frequently found in more open landscapes than in woodland coppice. For example, the high brown & silver-washed fritillaries were last seen in the Stowmarket and Belstead areas of Suffolk in the late 1950s, and the small pearl-bordered and pearl-bordered fritillaries were both lost by 1959 (Mendel & Piotrowski, 1986). I am sure you are all familiar with the sad but explicable declines in these species, due to changes in woodland management, such as the discontinuation of coppicing. Apart perhaps from the dark green and silver-washed fritillaries, these declines still seem to be continuing today in southern and eastern England, despite efforts to redress the problems by Butterfly Conservation. It is possible that isolation as well as lack of management may have played a part in the process, for the network of former sites of occurrence has been irrevocably destroyed from the 1950s onward. We can hope that some Wildlife Trusts' efforts to restore coppicing in their reserves might redress these species' declines. Within the general area of Pamber Forest area on the Hampshire/Berkshire border there were up to the 1950s several sites where the smaller fritillaries could move from one site to another. The last pearl-bordered fritillary, *Boloria euphrosyne* (L.), seen at Pamber was in 1979 so it seems that the butterfly has probably now gone from this site, although it is one of our most well-managed.

Parts of Pamber may be under-recorded, as also are other local habitats, but local entomologists assure me that they would expect to see vagrants more frequently if this species still occurred anywhere in the area. (M. Harvey *pers. comm.*). But the small pearl-bordered fritillary, *Boloria selene* (D. & S.), is hanging on though it is thought by the site manager (G. Dennis, *pers. comm.*) that extra stock may need to be brought in to boost the genes of this population. The silver-washed fritillary, *Argynnis paphia* (L.), is seemingly doing as well as ever, no doubt because of its greater tolerance of shade. A number of nearby localities also lost their fritillary populations between the 1940s and the 1960s. Apparently the last Berkshire record for

the pearl bordered fritillary was at Fence Wood in 1978 (Baker, 1994). However, a few singletons were found nearby, along the Hampshire and Berkshire border, between 1987 and 1992, (M Harvey, *pers. comm.*). Pamber Forest, although a large site, is becoming increasingly isolated. The nearest big woods where *some* of these species *may* still occur are Butter Wood near Hook (16 km SE), Alice Holt Forest (32 km S) and Harewood Forest (40 km SW). What would induce any of these fritillary butterflies to fly such distances to or from Pamber? (Morris & Thomas, 1989) suggested that the sedentary species were unlikely to colonise new habitat if it was between 400 metres and 10 km away from existing colonies. Almost certainly they considered that some suitable areas would never be reached under modern conditions.

In south-east England the woods are still there but increasingly without the smaller fritillaries. Perhaps the remaining fritillary butterflies are inbreeding with little genetic mixing occurring. If so, this is an effect of modern "landscape fragmentation which decreases patch areas and increases distances between habitats and can convert 'core' landscapes into 'marginal' ones, and 'marginal' landscapes into 'uninhabitable' ones", (Thomas *et al.* 1998).

In this scenario of isolation the future role of the entomologist interested in conservation could be to research and secure small areas that provide the link between larger sites in public ownership and other nature reserves. As intervening spaces get larger and emptier, it is likely to become more important to learn how all uncommon species spread between habitats. Here is an opportunity for members of this Society to design their fieldwork to find out this information.

However, the other major conservation organisations do not seem to be succeeding in keeping these populations on their land either. The RSPB (Cadbury, & Shardlow, 1998) reported that the best recent year for the pearl-bordered fritillary in their transects at Blean Woods, Kent had been 1987. Despite continuing appropriate management, none had been seen in 1994–96 and just one in 1997. Similar results were reported from their properties in Devon with the last good year in 1987. However, recent Butterfly Conservation maps appear to show the situation for this species in the Blean area is somewhat better, this being an area where economic coppicing still continues today.

Both pearl-bordered fritillaries have been lost from Bernwood Forest. One possible reason cited is that only rides were managed for the species, while coppicing had not been increased. The general increase in deer numbers is another possible cause, with the non-native muntjac deer consuming ride-side flowers (M. Harvey, *pers. comm.*). If the latter is a cause of the decline, it might also be affecting the moths. This last consideration brings to mind a possible dilemma for the Wildlife Trusts, if there was ever definitive evidence against deer, could they cut back deer numbers on reserves without upsetting their members? It was reassuring to hear from a talk given by Matthew Oates to the Third International Conference of Butterfly Conservation in 1999 that the pearl-bordered fritillary was doing well in an 800 hectare woodland in Gloucestershire and was being maintained, by the activity of fallow deer (*Dama dama*).

Some scientists have begun to suggest that the general decline is some sort of climatic effect, so the fact that there are important Scottish populations of this butterfly surviving in woodland canopy gaps, where violets grow amongst light bracken cover at the woodland edge, is a relief all round.

Whether we like it or not, in the future smaller habitat patches will be the rule, particularly in the south. The reasons behind this are the continued need or promotion by the market for more housing and employment developments, driven by population pressure and the consequent demand for an even better standard of

living. Perhaps an unfortunate by-product of any political system is that society is driven by what is popular and not necessarily by what is desirable, as seen by minorities such as naturalists. Have these isolation effects that are manifest in the butterflies become apparent in some moth and other invertebrate distributions? Will we see a similar shift north and westwards in them? Some lepidopterists have ventured to say yes. For instance, the double-line moth, *Mythimna turca* (L.), is now sparsely recorded outside western districts and yet before 1980 was more frequent in its occurrence in Hampshire and Essex.

OPPORTUNITIES FOR BENHS MEMBERS

I am sure that BENHS has an advantage in field entomology over other societies in having a higher percentage of its members active in the field. We must capitalise on the opportunities presented by this advantage. As a Society we seem to have a declining interest in butterflies, traditionally in favour of moths but increasingly in other orders. It is understandable that we should want to avoid duplication of effort but I really wonder if it is the right decision to leave nearly all UK butterfly study in the hands of one organisation. Should BENHS be that detached from butterflies to leave all activity to Butterfly Conservation? Yes, perhaps we can be that detached for butterflies, since after all many of us are members of both organisations, even I am a recent convert. Butterfly Conservation will need much money to reverse the trends outlined above, and it may be an impossible task. The best option for BENHS members is co-operation in what are fundamentally shared ideals.

BUT WE SHOULD *NOT* BE SO COMPLACENT ABOUT THE MOTHS

The losses among the butterflies typified by the examples quoted above may be matched correspondingly for moths if we do not continue to monitor their populations. The arguments for limiting the collecting of butterflies are already proven in the UK. But many moths still need to be taken to be identified. I believe this latter argument is won within Butterfly Conservation, in the main. There remain pockets of their membership who seem to suggest that all lepidopterists should be happy to refer to collections in central institutions and not to make their own collections. This remains a very misguided viewpoint when we consider the number of invertebrate species that have been split into two or more species in the last 50 years. By volunteering information on moth distribution to others can we trust them to allow us to carry on collecting moths when they are indulging in programmes to aid population recovery of the very same species? Does the caution in providing information to others, such as the Wildlife Trusts, still prevail? Allan (1943) wrote that those who knew of localities outside the New Forest for the light crimson underwing, *Catocala promissa* (D. & S.) were wise to keep them a secret, but this was probably from other collectors at that time. If such secrets are still being kept it might explain the current absences of many species from some localities on distribution maps (e.g. Fig. 5b.)

LEGISLATION ISSUES AND THE FUTURE OF COLLECTING

Can plain collecting, without providing added value in ecological or biological information, continue? The answer is that of course it must, otherwise recruitment of future entomologists will be much reduced. It does seem to be continually under threat as the next example should serve to illustrate.

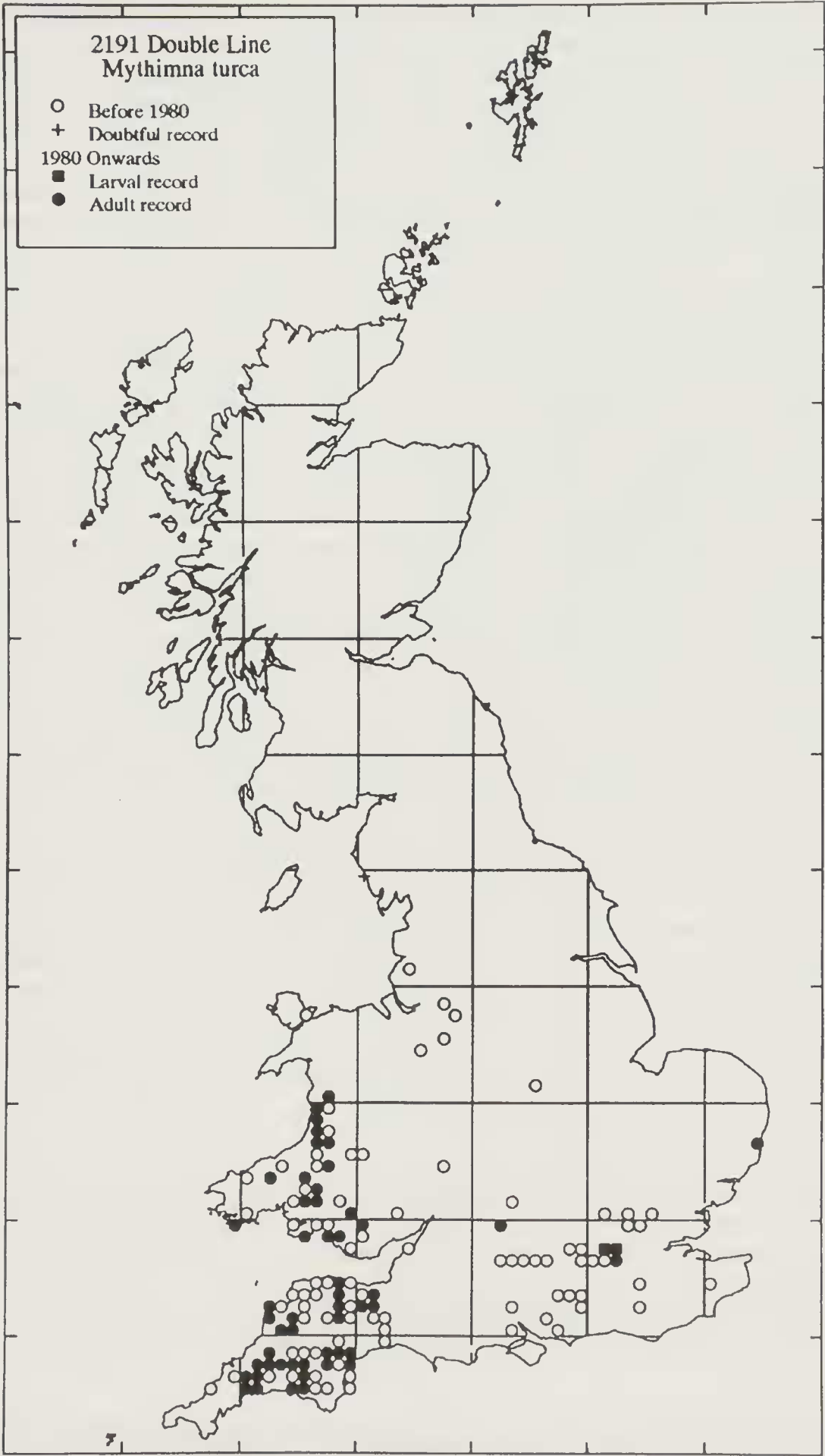


Fig. 3. Double line *Mythimna turca* (L.) distribution map.

Wildlife and Countryside Link is the liaison body for voluntary organisations in the UK concerned with the conservation and protection of wildlife and countryside. In 1997 this organisation published a leaflet "Wildlife Law: time for reform", a charter supported by 22 other organisations from The Wildlife Trusts to Greenpeace, including Butterfly Conservation. This leaflet suggested, amongst desirable issues such as greater protection for SSSIs, that "more species should be protected by bringing the current schedules (of wildlife laws) up to date with the UK Biodiversity Action Plan". Had we been active and full members of Wildlife and Countryside Link in 1997 we might have been able to influence them positively against this direction when they published this leaflet.

Subsequently the Government's Joint Nature Conservation Committee and Wildlife and Countryside Link considered this subject further, at which this Society amongst many others was invited to contribute its views. The results were published as a synthesis of the views of those interviewed and attending the focus groups in *A Review of the Operation of Species Legislation in Great Britain* (King, 1999).

I consider that more laws to protect increased numbers of species will be unenforceable. At the same time they would have a negative effect on entomology and the public's perception of entomologists. I consider that any action that makes it more difficult to collect and monitor all but the most endangered species will lead to a reduction in enthusiasts, who are the compilers of all the reliable information to recording schemes. If the motivation of collecting is removed, I believe that there will be many less people to go out at night to monitor moth populations, for instance, despite the growth of moth-watching groups. But this is what the rest of the natural history community seemed, perversely, to want to limit. The addition of all the Biodiversity Action Plan invertebrates (*c.* 160 species), including at least 46 more moths, would have been a step too far! It would have made it extremely difficult for us to work on many of these more local moths if they had all been placed under the schedules of the Wildlife and Countryside Act, 1981. As a Society we need to monitor this type of inappropriate proposal very carefully indeed. From what I have seen of the recently proposed Countryside and Rights of Way Bill (March 2000), it does not provide this species protection but seeks to restrict wider land entry to those carrying nets for hunting animals. This clause, though having another target group of people in mind, could require all entomologists to have permission for their activities before entering what is to be called access land (or "Right-to-roam land") if the Bill is approved by Parliament.*

At the 1999 Annual Exhibition of the Society many of you will have seen the BENHS Conservation Working Group's joint proposals for working with Butterfly Conservation on many of the Biodiversity Action Plan species, which would be put in jeopardy with more legislation.

However, my information is that other organisations represented on Wildlife and Countryside Link, such as Friends of the Earth, are still pushing for increased species protection to be included in the Countryside and Rights of Way Bill. Their magazine called for greater protection for rare species occurring outside SSSIs (Friends of the Earth, Spring 2000). One practical step we could take straight away would be to join Wildlife and Countryside Link as full members. The previous route to representation, which we had jointly with the Amateur Entomologists' Society through the

*As of late March 2000 this issue has been raised at the Joint Committee for the Conservation of British Invertebrates (JCCBI) and is being pursued through Parliament and the House of Lords.

Joint Committee for the Conservation of British Invertebrates, weakened our scope for activity. It is my view that we should be represented despite the considerable cost. If we do not sit at the same table, our views will never be understood and taken into account when misguided legislation is suggested. But who in this Society is able to attend the mainly midweek meetings of this organisation, should they choose to admit us? The skills needed are great knowledge of all aspects of invertebrates, natural history issues and government legislation mechanisms, a feeling for politics and articulate persuasion. In other words, we need a new type of entomologist! My perception is that most entomologists would rather be studying their insects or working out in the field!

As a prominent natural history organisation we must find individuals to argue from the entomologist's perspective and to commit personal time to combating some of the anti-collecting attitudes that arise in non-entomologists. Otherwise we should not be surprised if our views are quashed by the overwhelmingly, and quite naturally for higher animals, must-not-kill attitudes of other naturalists. This current lack of representation, I suggest, is one reason why an invertebrate conservation trust fund is needed to promote entomologists' views independently of Government. A similar problem has been cited in Europe (Kudrna, 1997), where there is a failure on the part of European administrators to appreciate the needs of those wishing to monitor butterfly populations. In Germany and Spain it is made extremely difficult for the entomologist, especially the amateur, to indulge in his interest in collecting insects. I suspect that this is a matter of expediency, for the less the authorities are informed of where special sites are, the less effort they have to spend protecting them and managing them for their invertebrate interest. In this way the majority interests of European agriculture and forestry are satisfied at the expense of a minority.

This contrasts with the European treatment of hunting—from the Natura 2000 and People Conference held at Bath in 1998, I quote: "Hunting is a legitimate activity under the Birds Directive, and is not *a priori* to be excluded from Natura 2000 sites" (Natura 2000 Newsletter—Special Edition, 1998). This network of nature sites results from the European Commission Habitats Directive, of which you may have heard. Europe is another area where the Invertebrate Conservation Trust, if made European, could extend its interest. The British role could be to stimulate invertebrate collection in Europe, especially by amateurs. Campaigning through our MEPs could remove the barriers to collecting by ensuring that European countries are also pursuing biodiversity studies of invertebrate populations and that they have monitoring programmes in existence.

BIODIVERSITY ACTION PLANS

I feel that it would be rewarding if more of the Society's members were to work a little more deeply on the UK Biodiversity Action Plan lists of species. As a Society we could retain this information centrally as well, should we need to use it to obtain or defend sites. I will use tonight to put forward a few contentious ideas for moth studies, although I, not being a lepidopterist, am of course open to criticism. As a caveat, however, we have to remember that amateur entomologists need to enjoy what they are undertaking, so, for some research, it remains the best option for the now very numerous contract entomologists or university-based entomologists to do such work.

Some of the species which I think have somewhat puzzlingly limited distributions, that I have difficulty in believing, are the following: the heart moth *Dicycla oo* (L.), dark crimson underwing *Catocala sponsa* (L.), light crimson underwing *Catocala*

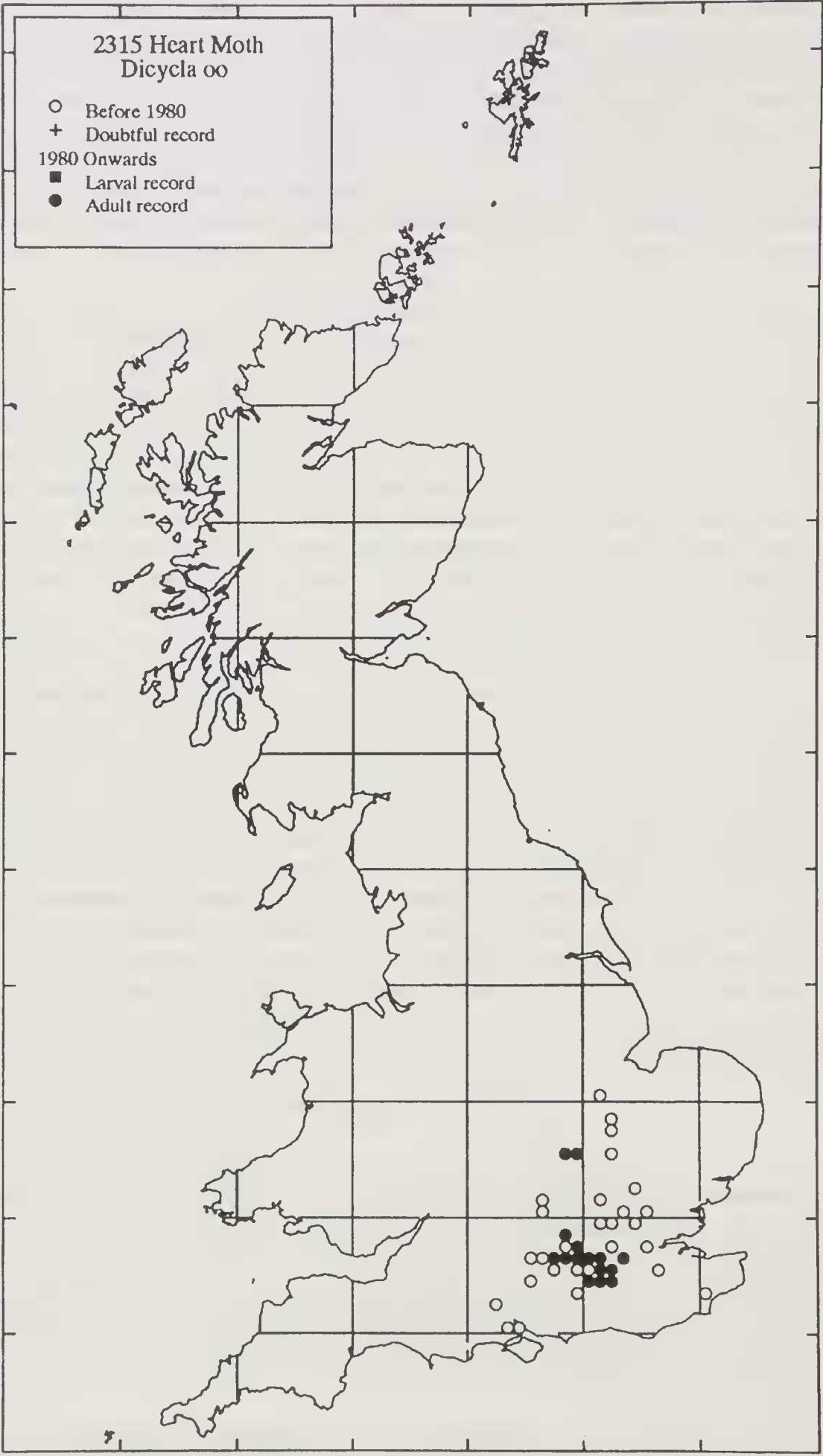


Fig. 4. Heart moth *Dicycla oo* (L.) distribution map.

promissa (D. & S.), double line *Mythimna turca* (L.), narrow-bordered bee hawk-moth *Hemaris tityus* (L.), bordered gothic *Heliophobus reticulata marginosa* (Haworth), sword-grass *Xylena exsoleta* (L.), the four-spotted *Tyta luctuosa* (D. & S.). I will deal with the first four only, as examples.

Heart moth *Dicycla oo* (L.)

I find it extremely strange that this species is so limited in occurrence. It is believed to be a canopy feeder on oak, yet the latter are abundant, so why is its distribution so limited? Skinner (1998) says it occurs in open woodland and parkland with mature oaks, but this habitat is of common occurrence throughout the country. And why is it seemingly confined to the east of England, and even lost from the New Forest? In Surrey its main site of occurrence appears to be the adjoining Epsom and Ashted Commons. The pasture woodland at this latter site has an under-storey of bracken in many areas and is considerably susceptible to fire, of which a number have occurred, afflicting the ancient oaks. A similar habitat occurs in East Berkshire including Windsor Great Park, where the moth still occurred in the 1980s. This site also has a bracken under-storey, which is probably insignificant, but both sites have pollarded oaks. But what could be different about these oak trees or their growing situations and spacing from other trees? The literature does not seem to record what flowers or energy sources this species visits of a night, other than the exceptionally rare treat of the entomologist's sugar! My experience as a dipterist of hunting for dead-wood species in pasture woodlands with bracken is that flower sources are infrequent in June and July. Possible flowers at this time are wild roses, dogwood, elder, blackberry and privet. As this species visits sugar, are natural sap-flows of oak important to it? Or if the sugar solutions in honey-dew are much more necessary, how prevalent are the latter in pasture woodland with few low-growing shrubs? In areas where these sap-runs occur, I have often observed numerous moth wings lying at the foot of such trees, where they have been killed by wasps. Those who use light-traps to attract the moth record that it is only active on warm, still nights. What does it do the rest of the time? If we don't know the answers to these questions, I would suggest that it's about time that we did! Torchlight transects have been suggested as a way of finding out the required information, but I doubt if that would appeal to lepidopterists. Dusking at flowers is another technique but, once the light-trap starts attracting moths, it seems to be forgotten about. If this species comes to light late in the night, it may also visit flowers or honey-dew at similar times. The last Hertfordshire record was in 1971 at a garden trap, but the hope remains that such populations continue to live on unseen by lepidopterists, since in 1999 a specimen was captured in a grid square in Hampshire from which it was previously known but had not been taken for some time.

Dark crimson underwing *Catocala sponsa* (L.) and light crimson underwing *Catocala promissa* (D. & S.).

Apart from the distribution, much of what I have already said applies also to these two species. Conversely, the centres of distribution for them, especially the latter, seem to have almost totally reverted to the New Forest and nearby. Some believe that the climate has warmed slightly but *C. promissa* appears to have retreated southwards, the opposite to what you would perhaps expect. They both occur in some of our larger oak woods but there seem to be no clues as to why larger woods should be more important than smaller ones. Young (1997) inferred that this preference was just guesswork, more enthusiasts are needed to rise to the challenge to determine these life-histories? There is also the perception that lepidopterists tend to

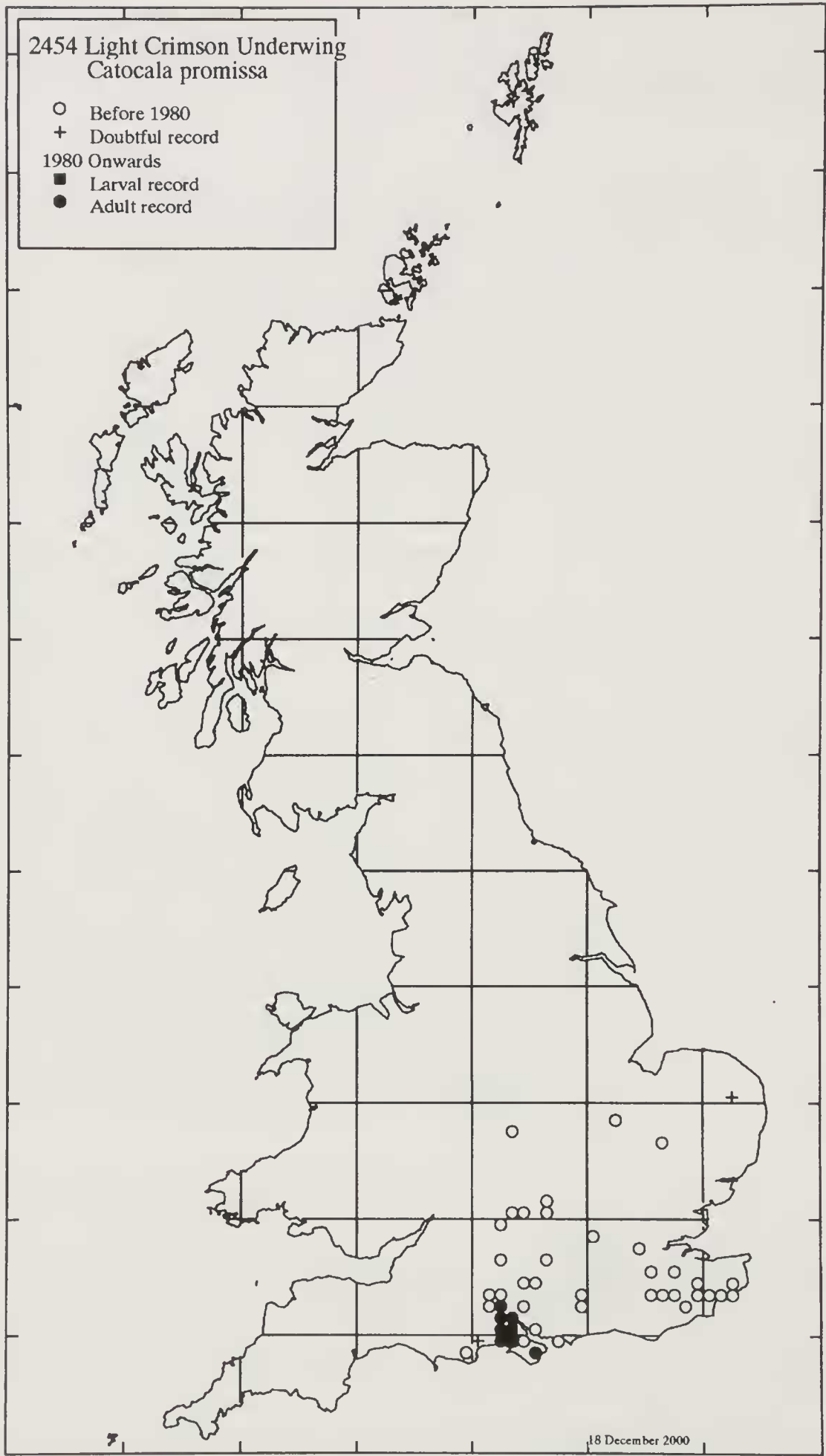


Fig. 5. Light crimson underwing *Catocala promissa* (D.& S.) distribution map.

target sites where they will be successful in procuring these species, but that they do not work systematically by grid square. For instance, there are many pre-1980 records for Kent and East Sussex, but the empty dots do not tell us how many times these localities have been visited since 1980 for zero results.

Double line, *Mythimna turca* (L.)

I find it curious that at only a second major field meeting to Richmond Park many examples of this species turned up, where they had not been recorded for many years (Waring, 1993). Does this indicate lethargy on the part of lepidopterists or are there just too many sites to go to? The other curiosity is that this site is closed in by urban areas and subject to high levels of pollution, and yet the moth is still abundant. There appears to have been a decline of this moth in the wider countryside outside the south-west of England and Wales, probably due to agricultural improvement. It is believed to require rough unimproved pastures but there are still many of these in south-east England. There is obviously a more subtle requirement for a very specific type of grassland, which makes a splendid opportunity for members of this Society to indulge in some practical research.

WHY SHOULD ENTOMOLOGISTS EMBRACE BIODIVERSITY ACTION PLAN RESEARCH?

Better knowledge of invertebrate life-histories will be obtained by the process. Alan Stubbs, writing in his presidential address to this Society eighteen years ago, said "one of the saddest things is that after so many years of the study of butterflies, entomologists have failed to provide the information necessary to manage habitats for these insects" (Stubbs, 1982).

In recent years, arguably, Butterfly Conservation has led on life-history research, but I believe that members of this Society could do more. Until or unless an Invertebrate Conservation Trust is established, it is essential, I believe, that the BENHS is involved in all moth research and especially, because with a greatly increasing UK population, the continued need or promotion by the market for more housing and employment developments will inevitably lead to further losses of the habitats we treasure.

POPULATION PRESSURE AND DEVELOPMENT

Human population pressure, modern changes in family relationship statuses, industrial and transport built infrastructure. These have all changed considerably and are set to change even more, placing more isolation risks on wildlife sites. The Government's Office for National Statistics has indicated that the population of south-east England is expected to rise by 13% in the next 20 years, and Ministers have stated that a further 860,000 homes need to be built in the south-eastern counties over the next twenty years. For England and Wales the latest figures as of March 1999 were 52.2 million people at May 1997, 200,000, up on the figure for mid-1996. (Source Government Computing magazine.) A recent world map published in December 1999 by the Royal Geographical Society gave the UK figures as 59,400,000 on a land area of 244,100 sq. km, whereas for France it is 59,080,000 on more than twice the UK land area of 543,965 sq. km in which to fit everybody in.

These plans are likely to lead to considerable losses of countryside in all these counties. Even if only 50% of the area is eventually developed because the figures are over-estimates, this would still have a significant impact on the current landscape.

	SERPLAN proposals	Public Examination (% increase)	Total area of rural land under threat ¹
Bedfordshire	42,890	64,000 (49%)	27 sq. km
Berkshire	53,261	83,000 (56%)	23 sq. km
Buckinghamshire	54,300	92,000 (43%)	39 sq. km
East Sussex	37,458	64,500 (72%)	27 sq. km
Essex	83,900	150,000 (79%)	62 sq. km
Hampshire	101,900	169,000 (66%)	68 sq. km
Hertfordshire	50,900	88,000 (73%)	28 sq. km
Isle of Wight	9,553	13,000 (36%)	2 sq. km
Kent	99,700	150,000 (50%)	64 sq. km
Oxfordshire	41,500	75,000 (81%)	41 sq. km
Surrey	34,937	77,000 (120%)	22 sq. km
West Sussex	44,900	73,000 (63%)	29 sq. km
South East (outside London)	668,500	1,098,500 (64%)	432 sq. km)

¹Based on estimates of urbanisation for every 1,000 houses calculated in Department of the Environment's Urbanisation in England: Projections 1991-2016 (1995). Differences between counties reflect the varying potential for using urban land and buildings.

Fig. 6. CPRE TABLE—The impact on the shires.

The squeeze will be especially evident where there is pressure *not* to develop floodplains and high-yielding agricultural land. In all south-eastern counties except Oxfordshire, it is policy that such development will go on “brownfield” sites. I suggest to you it that it is these very brownfield sites that in many areas form links between the remaining semi-natural habitats. In many cases they are refuges for localised species forced out of niche habitats elsewhere by urbanisation and intensive agriculture. Peter Harvey writing in an article on the East Thames corridor (Harvey, 1999) revealed that this area was very valuable for aculeate Hymenoptera, since it contains areas of old mineral workings, post-industrial areas including old silt lagoons, and even some flower-rich unimproved areas. In an area equivalent to one 10 km square, 49% of the British fauna of bees, wasps and ants have been recorded. But again the previous lack of local knowledge has been revealed, as nearly all of this area is under imminent development threat. Despite the immensity of the job, this lack of prior knowledge of the whereabouts of important species assemblages remains a significant weakness in invertebrate conservation. This is because it is *not* in the hands of an invertebrate equivalent of the RSPB. We, in entomology, lack a central organisation holding such information, able to react instantly on the strength of this knowledge, and independent of the policies of Government. Remember that English Nature, the Countryside Council for Wales, and Scottish Natural Heritage have all seen reductions in their entomological staff and consequently in their ability to act quickly. A further implication of development and exponential population increase is what I refer to as the knowledge impediment, that we entomologists, do not yet know the answers to fundamental questions that may guarantee the survival of sensitive species in the years ahead. There is perhaps little time left for us to find

out all the answers we require before these developments or climatic effects occur. This talk looks at the next 100 years, the building developments announced recently could be compounded by four more similar amounts of housing and infrastructure development by the end of this century.

OTHER INVERTEBRATES

In comparison to the butterflies, and perhaps some dragonflies, crickets and grasshoppers, I personally believe that the picture of scarcity of many species in the "other orders" is a lot better than when the NCC's British Red Data Book for Insects (Shirt, 1987) was published. Almost every rare bee, wasp or fly that I have taken in the last twenty years has been taken subsequently by others, even some of you in this room. *Andrena hattorfiana* (F.) is one of our largest solitary bees, frequenting Salisbury Plain and chalk downland slopes. Ten years ago it was thought to have declined substantially but, with increased examination of its old haunts, hymenopterists have re-found it on the chalk hills of East Anglia and southern England. What it must have is an annual supply of flowers of field scabious and greater knapweed, each year without exception. The kind of management you require for this solitary bee would not suit the adonis blue butterfly *Lysandra bellargus* (Rott.). This is likely to be an area where a single-order study group will run into management priority problems as sites are reduced.

DOT MAP DISTRIBUTIONS

Now that we have interactive on-line computer networks, perhaps this technology could be adapted for dot-maps to become much more intuitive and instructive. I am sure it would be a big improvement if we were able to double-click on a grid-square dot to reveal much more sensible and coherent information, password-protected as necessary. Such as how many discrete populations and their locations exist in a 10 km square for any one species? Of course this should only be done for a few species, those of conservation concern or of fast-changing distribution patterns. It would also be most interesting to know how many sites were searched for a scarce species and for how long, without revealing its presence. In other words, how much effort has been applied to each 10 km square.

RED LIST CATEGORIES AND DISTRIBUTION STATUS CHANGES

An equal concern is the maintenance of the modern equivalents of Red Data Book statuses. As I have already shown tonight, our insect fauna is constantly changing. These conservation statuses of the International Union for Conservation of Nature and Natural Resources (IUCN) as applied in Great Britain, should reflect these changes on at least a five-yearly cycle, if not dynamically. (Eyre, 1998) was also critical of the slowness of deciding RDB statuses because research he was associated with in creating species indices could not be set in an RDB context until these statuses had been decided. For instance a few species of hoverfly and wasp, that were categorised as endangered or vulnerable, no longer merit such a high designation e.g. *Callicera rufa* Schummel, and *Philanthus triangulum* (Fab.). The greater targeting and examination of sites of occurrence has indicated that some species are more widespread than previously thought, so these designations should keep pace with such research, if the whole system is not to be scorned. Indeed, *Callicera rufa* was

downgraded in Falk (1991) after searches for larvae revealed that the species was more frequent than had ever been realised through observing adults.

A prime example of invertebrate status change is, of course, the Bee Wolf, *Philanthus triangulum* (Fab.), which was categorised as Vulnerable (RDB2) in 1986, but which I now consider common. From its occurrence at Sandown Bay in the Isle of Wight since 1851 and three other IoW sites, as well as Nacton Heath in Suffolk in 1976 and another heath in south Norfolk in 1983, it has now exploded in distribution, even occurring in the amenity grasslands of local authority housing estates and the imported sandy butts of rifle ranges on Salisbury Plain in the middle of the chalk (S. Miles, personal observations, 1999). I do not believe it could be ranked as even Notable now.

Would politicians understand such issues when compiling wildlife legislation? I suspect that they would not and might accuse all naturalists of over-egging the pudding when it comes to scarcity. During the period that some butterflies have declined, other insects and invertebrates have moved into the southern England or expanded their range. Are these two factors linked? I would suggest that this is something that we will urgently need to discover if we are to make coherent conservation decisions. A common factor noted in many of the current changes to our fauna is that they seem to occur in an east to west direction. As much as there is some depression at the losses of butterfly species, there is room for hope in the expansion of new species of other orders, that we now see around us compared, say, to the 1940s.

An even more striking example of an extension of range is the social wasp *Dolichovespula media* (Retzius).

The first finder of this species in the UK in 1980, Steven Falk remarked that, "there seems no reason why this species should not establish itself in England as it occurs throughout Eurasia" (Falk, 1982). As you can see (Fig. 8.), it certainly has established itself. Roesel's bush-cricket *Metrioptera roeselii* (Hagenbach) and the long-winged cone-head *Conocephalus discolor* (Thunberg) are other examples of steadily expanding species. It is interesting to note that (Marshall & Haes, 1988) listed both of these species as being, within their ranges, typical of trunk-route verges. There are many other insects that could be mentioned in this category.

CLIMATE CHANGE AND SPECIES

A recent Radio 4 Natural History Programme referred to an exotic bird, the little egret, being on the increase in southern England and having now reached Chasewater Country Park, a relict heathland industrial area near Birmingham. This is a most amazing change in such a short period, but of course it is also happening with invertebrates such as the spider *Argiope bruennichi* (Scopoli) that has colonised Dorset and is now reported from Wiltshire.

Contrastingly, in a global warming scenario, will our small wet quaking acid bog areas survive? Could such species as the large marsh grasshopper *Stethophyma grossum* (L.) become even more endangered? It is easy to visualise the scenario in 2025, when warming has continued so much that a malarial mosquito now occurs in New Forest National Park. By this time too many people have a vested interest in attracting tourists to the area, so the water bodies are expendable to favour the large numbers of human visitors. Additionally, there is the continued need for water abstraction for consumption by the UK's now 65,000,000 human population and the consequent lowering of the water-table. The result—wave good-bye to the large marsh

Philanthus triangulum

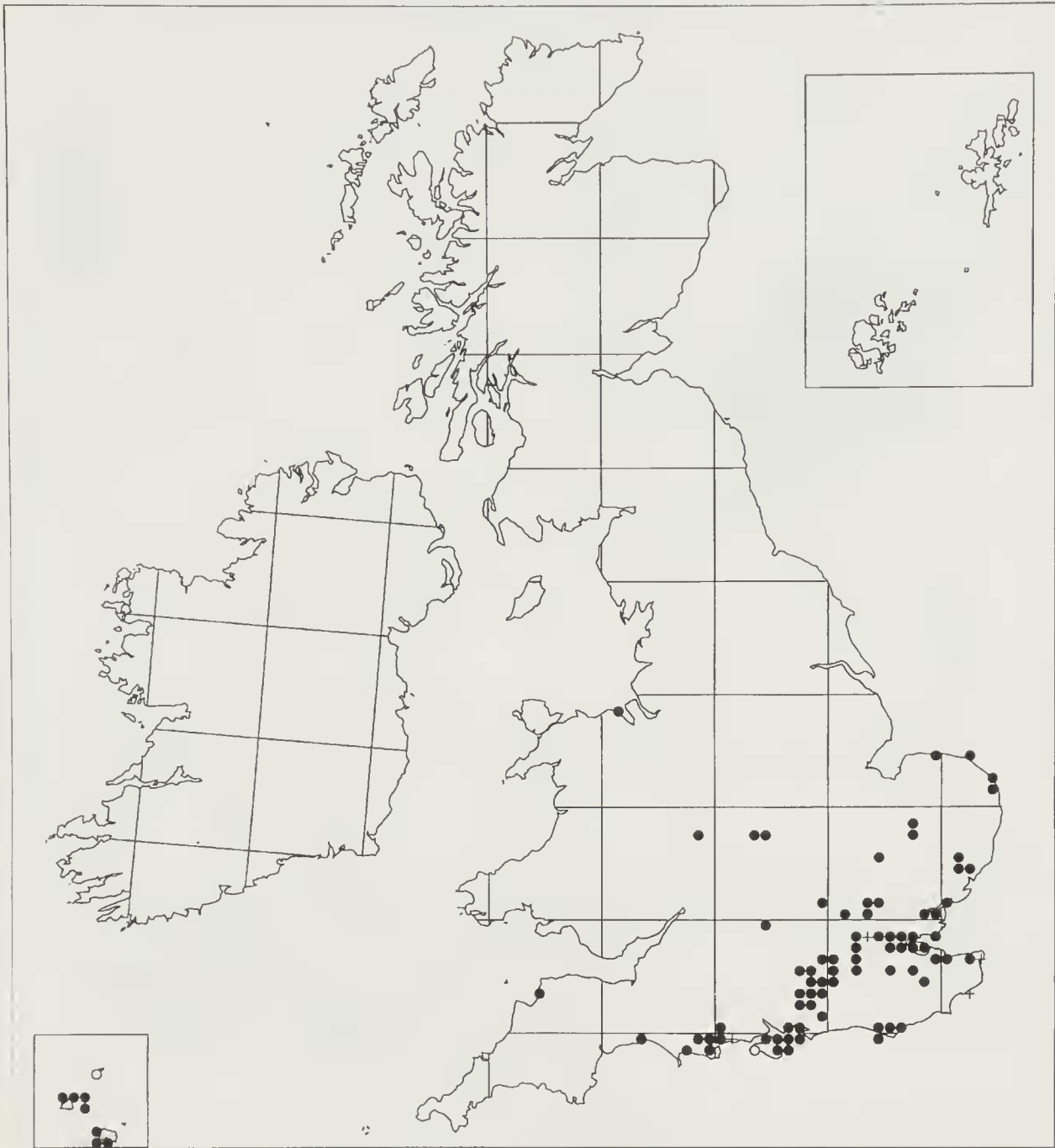


Fig. 7. *Philanthus triangulum* (Fab.) distribution map.

grasshopper. However, with current European weather conditions likely to occur in the UK in the future, will species currently restricted to certain specialised habitats be likely to become less discerning in their future habitat requirements?
(The Braeknell National Weather Centre described 1999 as the warmest year overall since records began in 1659. Their prediction was that the average UK temperature would be 2 degrees C higher by 2050.)

FUTURE REQUIREMENTS IN INVERTEBRATE CONSERVATION SCIENCE

There are still many gaps in our knowledge, some possibilities for future research might be the following, which it will be essential to know thoroughly, if species are to be conserved.

Dolichovespula media

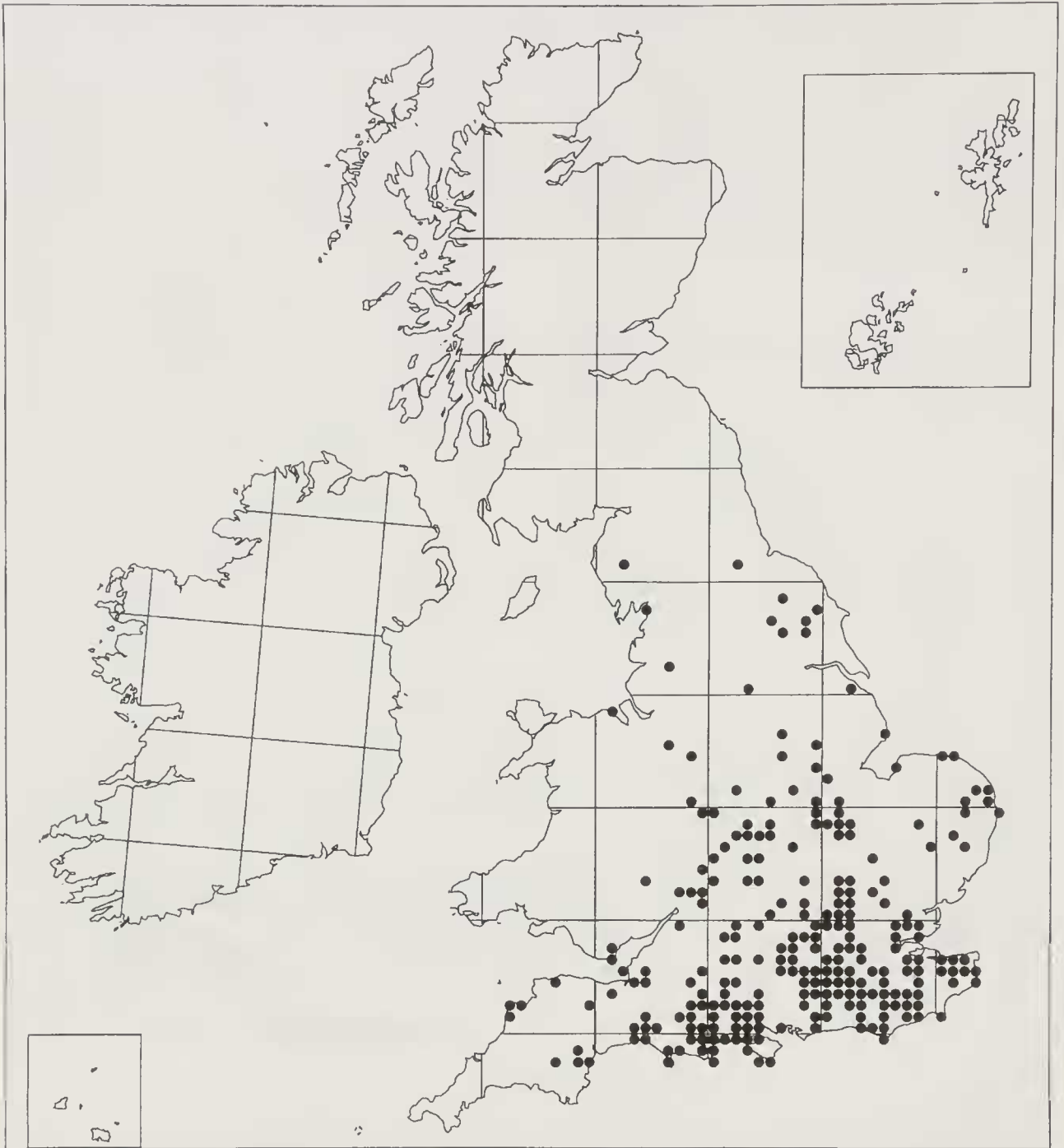


Fig. 8. *Dolichovespula media* (Retzius) distribution map.

1. What is the minimum size of an invertebrate population to enable it to survive in any one habitat annually, although not necessarily to be observed on a year-to-year basis? Is a population a single genetic stock?
 Rationale: we frequently hear of specimens being seen once again in localities after several years of absence (Rothschild, 1994). Could it be that they were present all the time though not at a high enough threshold level to be seen?
2. To which species are agricultural fields a barrier to their dispersal to other localities, and if they do form a barrier, what size of field or crop types form such barriers?

Roesel's Bush-cricket *Metrioptera roeselii*



Fig. 9. Roesel's bush-cricket *Metrioptera roeselii* (Hagenbach) distribution map.

Rationale: how do invertebrates spread to new areas? Is a network of inter-linked sites desirable and necessary, or just a problem in our own minds?

If a site such as Pamber Forest is genetically isolated, do butterflies travel many miles just to visit it or disperse from it? Many sites containing local species are now surrounded by much larger open fields, where the small networks of hedges that used to link the woodlands dotted about the countryside no longer exist. Is this a limit to other species' dispersal?

- 3. To which species are built-up areas a barrier to their dispersal to other localities, and if they do form a barrier, what size of urban area forms such barriers?

Rationale: as the remaining countryside becomes more urbanised, with more intrusive infrastructure, roads, street lighting, tidy hedges, neat grass strips and cycle paths where once there were roadside verges, will the species we have now survive in the second half of this new century?

- 4. Do motorways and other major roads inhibit or encourage dispersal?

Rationale: a study of carabid beetles, (Mader, 1984) revealed that major roads did appear to inhibit the insect dispersal, with very little evidence of species dispersal from island areas separated by a road. In addition there is an inevitable high casualty rate for all insects amid the turbulence caused by busy traffic. However, the wide verges of motorways, have the capacity I believe, to act as linear dispersal mechanisms linking one site to another.

- 5. The general structure and biology of a great number of invertebrate larvae remain unknown. Rationale: we cannot maintain populations of adults without knowing the requirements of the early stages.

Large Marsh Grasshopper *Stethophyma grossum*



Fig. 10. Large marsh grasshopper *Stethophyma grossum* (L.) distribution map.

6. Which species are the priority for research to be conducted by the entomological community? What are the factors that are likely to cause extinction in British species in the next hundred years? Or in other words, what species should members of this Society and other entomologists study now, in order to enable our successors to continue to study and collect these animals in the 21st and 22nd centuries?

Now in theory this should be easy to decide since the Biodiversity Action Plans should have encapsulated all of the relevant species, if only all entomologists could agree on the methodologies to decide on the critical species.

7. Should we devise a method to produce quantitative data on relative species abundance, of which we appear to have a paucity at present?

Rationale: what are the common features that identify years of abundance and scarcity in different species?

8. Has atmospheric pollution had any effect on invertebrate populations? (Idea from Barbour, 1986). Rationale: if roadsides are a dispersal network for many invertebrates, is this dispersal, especially for non-flying species, inhibited by roadside pollution?

9. If global warming is an actuality, what effect will it have on invertebrate populations in the UK?

Rationale: as temperature increases, it is likely that pest species prevalent in Europe today will be much more active further north. The present sympathy to the plight of the relatively benign species we have today may be much less in evidence in the future perhaps?

But at the same time many of these knowledge aspects are limited to observations and as Sir Richard Southwood in his Presidential speech to the Royal Entomological Society said some years ago, quoting from Sir James Gowans, "the things we would like to know may be unknowable" (Southwood, 1985).

REPRESENTATION

We do not seem to generate so many dynamic ambassadors for natural history, and particularly invertebrates, as perhaps we did in the past. Where are the future Peter Scotts, David Attenboroughs or even Simon Kings? Admittedly there is Roger Key, English Nature's entomological media personality, but there are few others to fill this category. Certainly there seem to be extremely few dynamic entomologists, but perhaps this is an oxymoron.

But we should be seeking more influence, whether it is writing about invertebrates in *Natural World*, attempting to become members of the council of English Nature or the Countryside Commission, or appearing on the media. I believe that more of us should be influencing such bodies at a high level. Another major weakness would appear to be the current lack of a strong body within the Royal Entomological Society concerned with conservation. This is a gap, that we in the BENHS as an amateur society should continue to exploit.

AN INVERTEBRATE CONSERVATION TRUST

A major option is the formation of an Invertebrate Conservation Trust. If supported by the British entomological community, this could tackle those issues that traditional societies like the British Entomological and Natural History Society or the Royal Entomological Society find themselves unable to do.

The following practical issues could then be addressed:

1. *Achievement of an invertebrate conservation trust concerned with all species and their management.* There is need for a unified UK organisation devoted to achieve the conservation of all invertebrate species and their habitats, and [avoiding the single species group trap], taking a balanced view of conservation management (Kirby, 1992).
 2. *Attainment of more popular support for invertebrates by demonstrating them to the public.* The attainment of more popular support for insects and other invertebrates and their sites of maximum diversity is especially necessary as more and more sites will be lost due to human population expansion in this new century.
- A. Entomologists have a particular role here, in organising more events to bring live insects and their habitat requirements to the public's attention, as I and the BENHS Conservation Working Group have attempted to do in the last few years. We have held events for the public at Dinton Pastures Country Park, Swanwick in Hampshire, at the RSPB's Minsmere reserve, with another scheduled for summer 2000 with the Herefordshire Wildlife Trust.
 - B. Another issue we can tackle is that of attempting to persuade local residents of the need to remove trees and shrubs from heathland, or encouraging woodland thinning through attempting to win hearts and minds through children's natural enthusiasm for invertebrates, known to them as bugs. We have probably all seen headlines such as "trees chopped by conservationists", or read that the local Wildlife Trust is ruining perfectly good walking country. What the public does

not know or does not care about is that insects in particular require very specific microhabitats, and one of our many roles is to illustrate this practically.

- C. The staff of Wildlife Trusts need to be given a better understanding of the needs of invertebrates. The Trusts have a high turnover of staff so such instruction needs to be communicated regularly. This Society does not have the resources to undertake this at present, but it could be a high priority for the proposed Invertebrate Conservation Trust.

3. *Entomologists to develop closer links with county Wildlife Trusts.*

Entomologists need to develop closer links with the county Wildlife Trusts on a reciprocal basis, both individually and through the major organisations already mentioned, but this is difficult when their societies do not have any staff working normal office hours.

4. *More support for invertebrate projects from major groups like the Worldwide Fund for Nature and government agencies.* More support is desirable for invertebrate conservation projects from the likes of the Worldwide Fund for Nature, IUCN and national Government agencies. From my perception this seems to be lacking but more might be forthcoming to a dedicated organisation.

5. *Greater understanding of the need to collect some invertebrates for accurate identification and monitoring.* More understanding is needed across the world of the importance of being able to collect insects for study easily without an excessive need to apply for permits and other red tape—this requirement applies particularly to Germany and Spain but appears to be growing elsewhere. Even among the UK's natural history organisations, there seems to be a prevalence of measures to "protect" insects in these ways that forget the need to monitor populations of species that cannot readily be identified. (Wildlife Link Charter publication, 1997).

6. *Availability of funds to study non-economically important invertebrates before they decline.* If invertebrates are at the other end of the spectrum to mammals when changes affect the environment, ie if they are the first to suffer diminution because of their annual life-cycles, then more study is needed of invertebrates in their habitats, and long before the time when mammals begin to decline.

7. *Acquisition of nature reserves specifically to manage invertebrate populations.* In the next 20 years the rest of the entomological community could perhaps start to acquire at least a handful of nature reserves, to be managed exclusively for invertebrates other than butterflies.

The rationale:

- a) the Charities Commission keep on urging the BENHS to spend more of its resources, and it would do the same for an invertebrate conservation trust, if that was formed.
- b) if we developed management expertise specifically for invertebrates, we could provide advice to others based on actual experience.
- c) subject to legal constraints, we could maintain some populations of weedy species that are so essential to pollinating insects but which appear to be unpopular in other organisation's reserves, e.g. ragwort, thistles.

- d) our aim might be to set up reserves that just safeguard a single hedge or line of trees which are known breeding sites for special species, to try to prevent losses such as that of a site of the scarce vapourer moth (*Orgia recens* (Hübner)) in Yorkshire in 1995 (Waring, 1995).
- e) avoidance of clashes of priorities, as are already said to be occurring with losses of other species when management of sites favours butterflies.

NATURE RESERVES AND ENTOMOLOGICAL ORGANISATIONS

Should the BENHS or the proposed Invertebrate Conservation Trust become a nature reserve owner and manager? Why not? If we truly believe that it is not collecting that does damage to invertebrate populations, a demonstration reserve showing the management techniques we believe in, as well as allowing collecting monitored on a long term basis, would be a good test. A reserves fund would also allow the Society or Trust to be a beneficiary in the receipt of bequests for such purposes.

CONCLUDING REMARKS

This Society, entomologists as a whole and naturalists in general face a continuing dilemma. Should we take a back seat and just watch the changes unfold, the normal ebb and flow, losses and gains of species, in other words be complacent in the belief that there is nothing we can really do to retain species? Or, should we be more positive and take a proactive conservation role in the belief that our Society or an Invertebrate Conservation Trust could make a difference, as Butterfly Conservation have perhaps already done? To take the title from the BBC Radio 4 programme, *The Choice*, our options can be tabulated:

Insect conservation: the choice

Decision	Result
Do nothing, observe and collect data, accept the status quo. As a Society stick to fieldwork and taxonomy. Leave politics and conservation to those interested souls and to the new Invertebrate Conservation Trust, if it gets established.	Some species decline, others increase, as they have always done. BENHS continues to make a contribution, as it always has done, to our knowledge of species' life-histories. BENHS remains manageable by volunteers. The Society continues to speak from a viewpoint of little site-management experience and has reducing influence over the growing subject of conservation matters.
BENHS or an Invertebrate Conservation Trust to start to acquire and manage nature reserves or give protection to very small parts of the countryside, e.g. single hedges, containing breeding sites of scarce species.	1. We disprove the idea that collecting damages most populations. (Our studies over the next 10-50 years) 2. We gain management experience, if we wish to advise others how to manage their reserves for our interests. 3. We use our sites as demonstrational reserves for the habitat niches we wish to see maintained, e.g. tree rot-holes, <i>not</i> artificial nest-boxes, bare sand areas, <i>not</i> continuous heather, river shingle areas.

Become proactive, even political, fight to save invertebrate habitats.

4. We produce invertebrate management videos and training material as a result of our experience.

5. We safeguard individual breeding sites for populations of invertebrates that would otherwise be lost.

Some species decline others increase. The public, other naturalists and perhaps even a few politicians become aware of invertebrate conservation issues, NOT just the butterfly ones.

I believe we have compromised historically between these two actions. But with the changes I have spoken about tonight, I believe we need to become more prominent as a Society in wildlife conservation issues. This will be especially necessary if for any reason, even apathy, an Invertebrate Conservation Trust is unable to become established. There is still a risk, particularly from those outside entomology, that all invertebrate collecting could be despised as much as butterfly collecting is now. This will be especially the case if entomologists are not providing added value in the form of more ecological knowledge about the species in which they are interested. As I have intimated tonight, there are so many vital questions that need answers for exceptional invertebrates to continue to flourish as well as the currently commonplace species. As was written in the final flourish to *The New Aurelians* (James, 1973) the centenary history of the British Entomological and Natural History Society "Although the future is misty, one fact is certain: the Society's potential is vast".

ACKNOWLEDGEMENTS

Thanks are due to Martin Drake of English Nature, David Element, Robin Williams, Graham Collins and Jim Porter for the loan of slides, to Mick Parker, David Green, Graham Dennis, Martin Harvey, John Muggleton and Pete Clarkson for additional information; to Mark Telfer and Henry Arnold of the Biological Records Centre, CEH Monks Wood, Paul Waring, Richard Fox and finally Butterfly Conservation for the preparation of some of the distribution maps. Acknowledgement is also due to all the volunteers of the respective recording schemes and societies that provided the records upon which these maps are based. I am also indebted to Nicola Frank of the Council for the Preservation of Rural England (CPRE) for permission to reproduce "Table 1—The impact on the shires". Any misconceptions are mine alone; personal communication or the loan of slides or other materials does not mean that the individual concerned has seen or agreed the subject matter of the talk or the arguments presented.

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RECORDING OF INVERTEBRATES AT DINTON PASTURES—A REQUEST FOR RECORDS

The Society have now been resident at Dinton Pastures Country Park for ten years and during that time there has been a lot of recording of invertebrates in the Park by members. Records have been gathered over that time and a list of what is so far known was recently compiled and has been passed to the Country Park management, who have undertaken to pass the information to the local Biological Records Centre. Comments on the Red Data Book and Nationally Scarce species recorded have also been provided.

The list presently includes 2268 species of invertebrates of which 2170 are insects, most of the remainder being spiders (73 species). Resulting from my frequent recording in the Park there are records of 1208 species of Diptera, more than 20 per cent of the British species excluding chironomids and cecidomyiids which have been poorly studied here. Some families are very well represented e.g. 31 of the 67 British species of snail-killing flies (Sciomyzidae) have been recorded. Other groups well recorded are Heteroptera (97 species) and Symphyta (103 species). Recording of Lepidoptera (312 species) and Coleoptera (259 species) has been less intensive, although some families have been well recorded.

So that knowledge of the Park's fauna can be as complete as possible details of any records made in the Park that have not already been submitted to me, are requested. Could any members who have collected in the Park please collate their records and pass them to me during the coming months so that this information can be incorporated in the list by the early summer.

A similar list has been compiled for California Country Park, also operated by Wokingham District Council. Recording there is at an earlier stage, with 807 species of insects of which 590 are Diptera so far recorded. Any records for this area would also be appreciated.

PETER CHANDLER